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Docket No.: 100P270US01

Remarks

In reply to the Final Office Action mailed on April 20, 2005, a Notice of Appeal was filed on May 13, 2005 and then an Appeal Brief was filed on June 22, 2005. After the Appeal Brief was filed, an Office Action mailed on September 7, 2005 withdrew the final rejection mailed on April 20, 2005 in view of prior art cited in the Office Action mailed on September 7, 2005. This Response is being submitted in reply to the Office Action mailed on September 7, 2005. Claims 1-22 are pending in the application, and claims 1-22 have been rejected.

As a preliminary matter, claim 18 has been amended for consistency. The "restraining member" has been deleted and the "perforated lid" has been added to be consistent with the rest of the claim. Favorable consideration of this amendment is respectfully requested.

Claims 1-22 have been rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter Applicants regard as their invention. More specifically, in claims 1, 5, 7-8, 11, 17-19, and 22, a "pattern" is unclear.

Applicants respectfully submit that a "pattern" is not unclear. On page 1, lines 10-14 of the specification, it is disclosed that an aggregate is typically coated with a binding material and then formed into a shape using a pattern. The binding material is typically hardened to hold the aggregate in the shape of the pattern so the bound aggregate can be removed from the pattern. The bound aggregate is then used in giving shape to molten metal so that the metal takes the shape of the pattern when the metal cools. A pattern is what is used to give the resulting sand mold a desired shape, and any suitable shape of pattern may be used.

It is suggested in the subject Office Action that a "pattern box" should be recited. Although a pattern box is disclosed in the specification as an example of a suitable pattern that may be used, a pattern may be any suitable shape and may be made of plastic, metal, wood, or any other suitable material as disclosed on page 3, lines 24-26 of the specification. Therefore, it is respectfully submitted that a "pattern" is not unclear. It is respectfully requested that this rejection be withdrawn.

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Claims 1, 8-9, 16, and 18 have been rejected under 35 U.S.C. 103(a) as being unpatentable over either U.S. Patent 6,843,303 to Siak et al. or U.S. Patent 4,226,277 to Matalon in view of U.S. Patent 4,947,923 to Rikker.

Siak et al. ('303) discloses heating moist gelatin coated sand particles with radio frequency energy to dry and strengthen the sand cores. As disclosed in column 4, lines 49-54, the process is enhanced if a small amount of airflow is used to draw the water vapor away from the sand and out of the core box. This can be accomplished by either drawing a partial vacuum on the core box or by pushing a small amount of dry, compressed air through the box after the water begins to evaporate from heating. A partial vacuum or a small amount of airflow is not sufficient to flash off moisture in the sand cores. It simply facilitates moving the small amount of airflow through the core box. The movement of airflow through the core box and the sand cores does not generate an internal pressure in the sand cores (lower the absolute pressure within the sand cores) to flash off the moisture in the sand cores as occurs in the present invention. Therefore, Siak et al. neither teaches nor suggests using a vacuum to flash off moisture in the sand cores.

Matalon discloses rapidly drying a silicate binder in a sand mold having preferably two or more air permeable sides (perforated faces) by forcing or drawing air through the permeable sides of the mold box and the sand contained therein by application of air pressure or vacuum. As in Siak et al. ('303), the movement of air through the mold box and the sand mold does not generate an internal pressure in the sand mold (lower the absolute pressure within the sand mold) to flash off the moisture in the sand mold as occurs in the present invention. Rather, Matalon relies upon the movement of air through the sand mold to dry the binder in the sand mold. Matalon neither teaches nor suggests using a vacuum to generate an internal pressure within the sand mold to flash off the moisture in the sand mold.

Rikker discloses a pouring container having five sections connected together by bracing clamping members. The lower section includes a perforated base having apertures containing porous plugs made of an incompressible material which allows gas to permeate into and out of the molding medium contained within the three middle sections but prevents the molding

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medium from falling into the lower section. As disclosed in column 16, lines 11-19, a coupling connection is made to the lower section, and the coupling connection can be coupled to a vacuum pump to create a vacuum inside the pouring container by withdrawing air via the perforated base as the molding medium is being dispensed into the pouring container. As disclosed in column 16, line 68 through column 17, line 10, after the pouring container is filled to the top with the molding medium, the coupling connection is disconnected. Therefore, the vacuum is used to facilitate the dispensing of the molding medium into the pouring container, not to flash off the moisture in the pouring container to dry the molding medium.

As disclosed in column 19, lines 56-62 of Rikker, during the molten metal pouring process, which occurs after the molding medium has been processed, a gas removal connection similar to the coupling connection is connected to the lower section. A vacuum is exerted and the gases resulting from the evaporation of the pattern by the molten metal will be evacuated from the pouring container and into a gas recovery system. The vacuum is used to facilitate the supply of the evacuated gases to a burner for combustion, not to flash off moisture in the pouring container to dry the molding medium.

The perforated base of Rikker is similar to the permeable sides of Matalon as they both allow air to be drawn through the pouring container and the mold box, respectively. In the Final Office Action mailed on April 20, 2005, Matalon was cited for restraining a sand mold mixture and it was stated that Matalon fails to teach the use of a vacuum for flashing off moisture in the sand mold mixture. As argued in the Amendment dated January 26, 2005 and the Appeal Brief dated June 22, 2005, the permeable sides of Matalon allow air to move through the sand mold mixture to dry the binder. The air is moved through the sand mold mixture using air pressure or vacuum. Thus, in Matalon, the sand mold mixture is not dried by restraining the sand mold mixture and using a vacuum to flash off the moisture in the sand mold mixture. This rejection based on Matalon has been withdrawn, and the present Office Action now states that Matalon fails to teach the use of a restraining member.

The perforated base of Rikker, like the permeable sides of Matalon, allows the movement of air through the pouring container and, therefore, the perforated base also does not serve the

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same function of restraining the sand mold to prevent cracks and/or voids in the sand mold. Rikker neither teaches nor suggests using the perforated base to restrain the sand mold during vacuum treatment of the sand mold to prevent voids in the sand mold. Therefore, because the perforated base of Rikker is similar to the permeable sides of Matalon in that it simply allows air to flow through the sand mold mixture, it is respectfully requested that the rejection based on Rikker also be withdrawn.

Although Siak et al. ('303) and Matalon teach using a vacuum to move air through a sand mold mixture, neither Siak et al. ('303) nor Matalon teach or suggest using a vacuum to flash off moisture in a sand mold mixture as in the present invention. Further, as stated in the subject Office Action, neither of these references teaches or suggests using a restraining member to restrain the sand mold mixture in a pattern. Rikker, like Matalon, includes a perforated base to allow air to move through the sand mold mixture, not a restraining member to restrain the sand mold mixture in a pattern. As recited in the claims, the present invention uses a vacuum and a restraining member to assist in rapidly drying sand molds without producing cracks and/or voids in the molds. Therefore, the present invention is not obvious in view of these references because none of the references teach or suggest using a restraining member or using a vacuum to flash off moisture in a sand mold mixture.

Claims 2-7, 10-15, 17, and 19-22 have been rejected under 35 U.S.C. 103(a) as being unpatentable over either Siak et al. or Matalon in view of Rikker and further in view of U.S. Patent 5, 320,157 to Siak et al.

These rejected claims are dependent upon claims that should be allowed. Therefore, it is respectfully requested that these claims also be allowed.


In addition to the above-arguments, although '157 to Siak et al. discloses the use of a vacuum to remove residual water from a sand core, nothing in '157 either teaches or suggests using a restraining member to restrain the sand during vacuum treatment. The present invention uses a vacuum and a restraining member to assist in rapidly drying sand molds without producing cracks and/or voids in the molds. This is neither taught nor suggested by these references.

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Favorable consideration of this Amendment is respectfully requested. Should the Examiner wish to discuss this matter, the Examiner is welcome to contact the under-signed representative for the Applicants.

Respectfully submitted,

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